A_1 = Specified minimum percentage elongation of the steel used—percent times 100 (i.e., if 20% use 20.0).

NOTE: For paragraphs (c) and (d) of this section the actual values for the tensile strength and percent elongation for the steel, as determined through tests on specimens from the group of plates to be used in the fabrication of the tank, may be substituted for the specified minimum values in the calculation prescribed in this paragraph (See §178.270–3 of this part). Test records or certification of test results by the material producer or tank manufacturer must be retained by the tank manufacturer for a period not less than 15 years and must be made available to the Department or the owner of the tank.

[Amdt. 178–65, 46 FR 9896, Jan. 29, 1981, as amended by Amdt. 178–97, 56 FR 66284, Dec. 20, 1991; 57 FR 45465, Oct. 1, 1992; Amdt. 178–99, 58 FR 51534, Oct. 1, 1993; 66 FR 45387, 45389, Aug. 28, 2001]

§178.270–6 Tank supports, frameworks and lifting attachments.

(a) Each portable tank must be constructed with a permanent support structure that provides a secure base in transport. Skids, frameworks, cradles, or similar devices are acceptable. The calculated stress in tank supports, frameworks, and lifting attachments must not exceed 80 percent of the specified minimum yield strength of the material of construction under the applicable loading conditions specified in §178.270–4(b).

(b) An IM portable tank that meets the definition of ''container'' in §450.3(a)(3) must meet the requirements of parts 450 through 453 of this title, in addition to the requirements of this subchapter.

[Amdt. 178–65, 46 FR 9896, Jan. 29, 1981]

§178.270–7 Joints in tank shells.

Joints in tank shells must be made by fusion welding. Such joints and their efficiencies must be as required by the ASME Code. Weld procedures and welder performance must be ASME Code qualified or must be qualified by the approval agency in accordance with the procedures in the ASME Code, Section IX, Welding and Brazing Qualifications. A record of each qualification must be retained by the manufacturer for the period prescribed in ASME Code, Section VIII, Pressure Vessels, and must be made available to any duly identified representative of the Department and the owner of the tank.

[Amdt. 178–65, 46 FR 9896, Jan. 29, 1981; 46 FR 24184, Apr. 30, 1981]

§178.270–8 Protection of valves and accessories.

Each valve, fitting, accessory, safety device, gauging device, and other appurtenance shall be adequately protected against mechanical damage.

[Amdt. 178–65, 46 FR 9896, Jan. 29, 1981]

§178.270–9 Inspection openings.

Each portable tank must be fitted with a manhole or other inspection opening sited above the maximum liquid level to allow for complete internal inspection and adequate access for maintenance and repair of the interior. Each portable tank with a capacity of more than 1894 L (500 gallons) must be fitted with an elliptical or round manhole at least 279 × 381 mm (11 × 15 inches), or 254 × 405 mm (10 × 16 inches), or with a circular manhole at least 381 mm (15 inches) in diameter. Any inspection opening and closure must be designed and reinforced as required by the ASME Code.

[Amdt. 178–65, 46 FR 9896, Jan. 29, 1981, as amended by Amdt. 178–104, 59 FR 49135, Sept. 26, 1994; 66 FR 45387, Aug. 28, 2001]

§178.270–10 External design pressure.

(a) Each portable tank not fitted with vacuum relief devices must be designed to withstand a positive external pressure differential of at least 0.4 bar (6 psig).

(b) Each portable tank fitted with vacuum relief devices must be designed to withstand a positive external pressure differential not less than the set pressure of the vacuum relief device and in any case at least 0.21 bar (3 psig).

[Amdt. 178–65, 46 FR 9896, Jan. 29, 1981, as amended at 66 FR 45387, Aug. 28, 2001]

§178.270–11 Pressure and vacuum relief devices.

(a) *Relief devices required.* Each portable tank, or each independent compartment of a portable tank, must be fitted with pressure relief devices in accordance with the following: